

# **A Description of Fisheries Management in the Turks and Caicos Islands: An Overview of the Problems and Suggestions for Mitigation**

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## **ABSTRACT**

Fisheries management is a highly complex and emotive issue in virtually every country in the world. This paper uses the Turks and Caicos Islands and its fisheries as a case study to highlight some of the issues that face fisheries managers though out the Caribbean. The Turks and Caicos Islands fisheries are dominated by free divers collecting Caribbean Spiny Lobster (*Panularis argus*) and Queen Conch (*Strombus gigas*), additionally there are several boats deploying lobster pots and fish traps. There is no significant commercial pressure on the scale-fish stocks, which make the TCI almost unique in the Caribbean, and there are only several commercial game fishing operations at present within the TCI. Overfishing of the lobster and conch populations is a major concern of the Department of Environment and Coastal Resources (DECR) tasked with managing the natural resources of the TCI.

In order for the DECR to meet these challenges, the implementation of several measure are key. These include:

- i) The removal of lobster from restaurant and hotel menus during the closed season;
- ii) A reduction in the number of foreign fishermen;
- iii) Banning of the hook used to catch crawfish;
- iv) Development of a method to detect the use of noxious substances used to catch crawfish.

In order for these actions to be implemented, the DECR requires strong political support which needs to be fostered through a comprehensive environmental education program aimed at policy makers, fishermen and the general public. This is especially important because rapid development of the TCI is stretching the resources and capability of the DECR to fulfill its requirements. The rapid growth of the TCI's economy is worrisome for the environment as it is easy to lose sight of the value and importance of the environment both economically in a country where the tag line is "beautiful by nature" and socially where entire communities are dependent upon the viability of the marine resources for there livelihood. Development needs to occur but at a pace where appropriate importance is placed on the natural environment. The TCI is at a crossroads right now because its fisheries are currently in decline but are still among the healthiest in the Caribbean.

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If the TCI does not learn from other Caribbean nations that have already been through a similar rapid development and economic growth phase, then the future of the fisheries resources looks bleak.

KEY WORDS: Conch, fishermen, fisheries management, lobster

### **Una Descripción del Manejo de las Industrias Pesqueras en Islas Turcos y las Islas de Caicos: Una Descripción de los Problemas y de las Sugerencias para la Mitigación**

La Administración de las industrias pesqueras es un asunto altamente complejo y muy emotivo en virtualmente cualquier país del mundo. Este trabajo utiliza a las islas turcos y las islas de Caicos (TCI) y sus industrias pesqueras como caso de estudio para destacar algunas de los asuntos que enfrentan los administradores de los recursos pesqueros a través del Caribe. Las pesquerías de las islas Turcos y Caicos esta dominada por buceadores a pulmón libre los cuales captura la langosta espinosa del Caribe (*Pamularis argus*) y el caracol reina (*Strombus gigas*), y además hay varios barcos que pescan con nasas de peces y langosta. No existe una presión comercial significativa en la pesquería de peces lo que hacen al TCI un caso único en el Caribe. Sin embargo la sobre pesca de las poblaciones de la langosta y del caracol es una preocupación muy grande para el Departamento del Ambiente y de los Recursos Costeros (DECR) encargados del manejo de los recursos naturales del TCI.

En la orden para que el DECR resuelva estos desafíos, la puesta en práctica de varias medidas es fundamental. Éstos incluyen:

- i) El retiro de la langosta de menús de restaurantes y del hoteles durante la temporada de veda;
- ii) Una reducción en el número de pescadores extranjeros;
- iii) La prohibición del anzuelo de capturar langosta;
- iv) El desarrollo de un método para detectar el uso de sustancias nocivas para capturar langosta.

Para que estas practicas puedan ser implementadas el DECR requiere de una fuerte ayuda política que debe ser fomentado a través de un programa de educación ambiental comprensivo dirigido a políticos, pescadores y al publico en general. Esto es especialmente importante porque el desarrollo rápido del TCI está estirando los recursos y la capacidad del DECR para cumplir con sus obligaciones. El crecimiento rápido de la economía de TCI es preocupante para el ambiente pues es fácil perder de vista el valor y la importancia del ambiente desde el punto de vista económico y social, especialmente en un país donde su emblema es "bello por naturaleza" y que depende de los recursos marinos para su sustento. El desarrollo necesita ocurrir pero a un paso donde se le de la importancia apropiada al medio ambiente natural. El TCI está en una encrucijada ahora porque sus industrias pesqueras están actualmente en declinación pero todavía está entre los más sano del Caribe. Si el TCI no aprende de

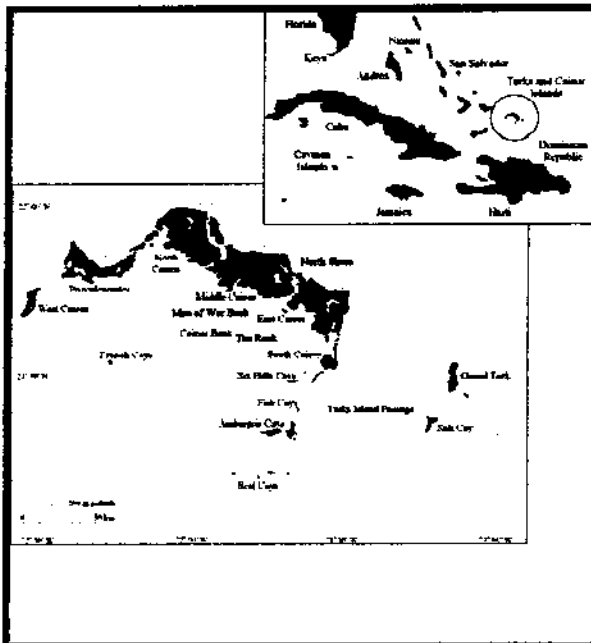
otras naciones del Caribe que han pasado por una fase similar de rápido desarrollo y crecimiento económico, entonces el futuro de los recursos pesqueros de nuestro país parece muy oscuro.

**PALABRAS CLAVES:** Langosta, caracol, pesquerías, manejo de pesquerías

### INTRODUCTION

The Turks and Caicos Islands are an archipelagic overseas territory of the United Kingdom located in the British West Indies (Figure 1) (Sadler 1997). Scale-fish are caught for subsistence usage as a by-product of the principle commercial fisheries of lobster and conch (Clerveaux 2001c).

The effective management of any fishery relies upon the application of restrictions based on the life histories, location and abundance of target species and considerations regarding the number and efficiency of fishermen operating in the fishery. An understanding of the political, social and economic environment that the fishery operates in is also important (Jennings 2001, King 1995). This paper uses the fishery of the Turks and Caicos Islands to highlight some of the problems facing fisheries managers and suggests some solutions that may be acted upon to ensure the continued existence of a viable fishery in the TCL.



**Figure 1.** The location of the Turks and Caicos Islands in the British West Indies

### RESPONSIBILITY OF THE FISHERY

The Ministry for Natural Resources controls the management of the fisheries by delegating day to day responsibility to the Department of Environment and Coastal Resources, encompassing the Fisheries Department (FD) and the Protected Areas Department (PAD). There are three DECR offices throughout the islands (Grand Turk, South Caicos, and Providenciales) at which Fisheries Officers operate and a National Environmental Center on Providenciales at which the PAD is based. The Director of the DECR is based on Grand Turk (the governmental administrative center) whereas the Chief Fisheries Officer is based on South Caicos (the fishing capital) (Bennett 2000). Both Fisheries Officers and Protected Area Officers have extensive law enforcement powers. Police Officers and members of Her Majesties Navy are also conferred the powers of Fisheries Officers. There is a Marine Branch of the Royal Turks and Caicos Islands Police Force (RTCIPF) that assists in Fisheries Enforcement with personnel (armed support), a spotter aircraft and offshore capable vessels (Table 1). The Environmental Health Department is involved in the management of the fishery by determining and enforcing the sanitary standards that the processing plants and seafood markets have to operate under.

**Table 1.** Law enforcement capabilities of the Department of Environment and Coastal Resources and the location of these assets and personnel throughout the Turks and Caicos Islands.

Assets/Personnel	South Caicos	Providenciales	Grand Turk
Fisheries Officers	4	5	2
Environment Officers	1	0	1
Scientific Officers	1	1	1
Protected Areas Officers	4	0	0
Research vessels	2	1	0
Protected areas patrol vessels	2	0	0
Fisheries patrol vessels	3	2	1
Patrol vehicles	1	2	1
Administrative personnel	1	4	3

Stakeholder involvement in the management of the fishery is encouraged through regular public fishermen meetings hosted by the DECR. In addition to this, bimonthly meetings are held by the Fisheries Advisory Committee (FAC) which are used to advise the Minister for Natural Resources on activities within the fishery (Bennett 2000). The FAC consists of retired and active commercial fishermen, processing plant owners, a representative from the national parks committee and representatives from the Ministry for Natural Resources and the DECR. The FAC is facilitated by the DECR, but is deliberately not lead by it since the aim of this committee is to provide stakeholders with an opportunity to assist in the management of the fishery and to create a forum for stakeholders to raise concerns within the fishery. The FAC also uses this opportunity to direct research conducted by the DECR.

An additional committee involved in the management of the conch fishery is the Convention in Trade in Endangered Species of Wild Flora and Fauna (CITES) Management Authority (Bennett 2000). The TCI CITES Management Authority is used to review scientific research and recommendations by the DECR pertaining to the annual conch quota. The committee sets the: amount of conch that can be landed; total amount of conch and conch trimmings that can be exported; and reviews size limits and the closed season for conch, in addition to ensuring that monitoring of exports and record keeping are conducted to comply with CITES. The TCI is not a full party to CITES, but adheres to the convention since it exports virtually its entire conch product to countries that are full parties to CITES (e.g. 99 % to the USA).

### THE FISHERY

The TCI fishery can be characterized as a predominately commercial fishery utilizing free divers to collect Caribbean spiny lobster and Queen conch (Table 2) with a small amount of scale fish caught as a by-product of the free diving operations for subsistence usage (Béné 2001). Use of pots and traps by fishermen to catch lobster and scale-fish respectively is limited. There are limited game fishing activities throughout the islands, primarily on Providenciales whereas commercial fishing for lobster and conch is based on South Caicos and Providenciales with a small number of fishermen and vessels operating from Grand Turk (Table 3). There are no operational commercial, scale-fish/ pelagic/ aquarium/ live-rock/ sponge/ bêche-de-mer fisheries within the islands. Virtually all of the fish sold in restaurants and hotels throughout the islands is imported from the United States. There is one commercial conch mariculture operation located on Providenciales which collects conch egg masses from the wild and then raises the conch for export.

**Table 2.** Catch and export figures for the lobster, conch and scale-fish fisheries of the Turks and Caicos Islands.

Year	Lobster landings (kg)	Conch landings (kg)	Scale-fish landings (kg)
2000-2001	288,852	810,502	625
1999-2000	252,889	730,770	1,084
1998-1999	310,878	640,310	0
1997-1998	228,285	781,425	0
1996-1997	179,505	730,935	2,065
1995-1996	307,685	956,925	1,058
1994-1995	373,860	946,305	13,356

Source: Department of Environment and Coastal Resources landing sheets and export data sheets.

Table 3. Commercial fishing effort within the Turks and Caicos Islands.

License period 2001-2002	South Caicos	Providenciales	Grand Turk
Commercial Fishermen	163	175	38
Commercial fishing vessels	78	92	18
Game fishing vessels	3	28	6
Processing plants	3	2	0

Source: Department of Environment and Coastal Resources commercial fishing vessel license application forms.

### Caribbean Spiny Lobster (*Panularis argus*)

Caribbean spiny lobster is the species that fishermen concentrate upon during its open season (1<sup>st</sup> August – 31<sup>st</sup> March) due to the high economic value of this species (approx. \$7.22/kg landed live weight at the processing plants). Lobster (legal size 8.3cm carapace length) are caught by fishermen free diving using fins and a snorkel enabling them to reach depths sometimes in excess of 18m (Clerveaux 2001c, Bennett 2000, Anon. 1998). When diving, the fishermen utilize a fishing hook attached to a fiberglass rod to impale the lobster and bring it to the surface. About 90 % of crawfish are caught during the 2001-2002 season using the hook. This practice - although illegal according to the Fisheries Protection Ordinance - has been ignored by the DECR since the expiration of a temporary waiver in 1990. Fishermen utilize the hook because this is more efficient than either the bully and net or the toss. Unfortunately once a lobster is "hooked" in the abdomen it often dies. Due to almost total mortality of lobster following hooking, little can be done if the lobster is subsequently found to be either egg bearing, undersize or tar spotted (possession of lobster exhibiting any of these traits is prohibited) (Bennett 2000). Undersize lobster caught intentionally/unintentionally are not usually landed at the processing plants, as this is where Fisheries Officers conduct most of their inspections. Illegal lobsters are either consumed by the fishermen and their families or sold on the "black market" to hotels and restaurants which serve the lobster as "lobster hash". To ensure a closed season, the DECR requires establishments selling lobster to file an annual return on the last day of the season stating how much lobster they have in their possession (the aim of this is to remove the "black market" demand for lobster during the closed season). However, this does not work. Commonly the lobster holdings of the establishment selling lobster do not diminish. To negate this problem and to reduce fishing effort during the closed season on lobster, lobster should be removed from the menu on restaurants and hotels, as has been done in other Caribbean countries. Unfortunately this is proving difficult to garner political support for as it is thought that this may effect tourist revenue – despite the fact that this scenario not been experienced by other Caribbean nations that do not allow the sale of crawfish by restaurants during their closed seasons.

Another deleterious practice occurring commonly in conjunction with the use of the hook is the use of gasoline, bleach or washing up liquid. The liquid is squirted into cracks and crevices to irritate the lobster into coming out into the open so they

can be easily caught. The introduction of hydrocarbons, chlorine or phosphates (from the washing up liquid) may have deleterious effects upon the flora and fauna comprising the substrate in the immediate vicinity of the use of this liquid (Bennett 2001, Bennett 2000). The fishing community is highly vocal about this method of catching lobster, with many of the older fishermen being opposed to its use and stating that reefs are dying due to this reason. The DECR is researching a technique to identify lobsters caught with bleach to provide a method of enforcing legislation that already bans the use of noxious substances to catch marine products. Bleach or gasoline is also used to wash off the eggs on berried lobster. Evidence of fishermen using bleach to catch lobster can often be observed as the clothes of the fishermen are often covered in bleach stains (Vaughan 2001 pers. obs).

### **Conch (*Strombus gigas*)**

Conch is the staple protein for the population of the TCI (Sadler 1997). Conch is collected by free divers and is "knocked" (shelled) onboard the fishing vessel (vessels used by fishermen throughout the TCI for the harvest of lobster and conch are predominately 5m Boston Whaler type hulls with a center console and a 75hp outboard engine with a crew of three) (Clerveaux 2001c). The meat is then landed at processing plants where fishermen are paid approximately \$1.80/kg. Conch is managed by a closed season for export (15<sup>th</sup> July - 14<sup>th</sup> October), size restrictions and a quota for 2002-2003 currently set at 747,776kg of landed product (meat plus trimmings), which is divided between the five processing plants. The processing plants then clean the meat obtaining 37 % meat 10 % trimmings and 43 % waste (Bennett 2001). The meat and the trimmings are then either sold locally or exported. Fisheries Officers regularly conduct inspections of the processing plants and the exported marine product. A backwards step in the management of the fishery was made in 2002 with a decision to revoke a requirement that all exported marine product had to be inspected and taped by a Fisheries Officer prior to export. This requirement had been in place for one year and allowed accurate tracking of the conch export, as well as ensuring that no illegal export of conch could occur.

### **Illegal Fishing**

Poaching (the collection of marine product) by unlicensed fishermen is a considerable problem in the TCI. The problem originates from two sources – fishermen from within the islands and fishermen based outside of the TCI. In the first instance, fishermen (predominantly Haitian illegal immigrants) go out to sea and fish either together or with a licensed foreign commercial fisherman (the licensed foreign commercial fishermen are also illegally fishing as they must fish with a "Belonger" on board the fishing vessel). These illegal fishermen exert considerable fishing effort since they also fish even in the worst weather when the DECR and other fishing vessels do not venture out to sea to either apprehend or report them (Bennett 2001, Bennett 2000).

A further problem for the TCI fishery and other Caribbean nations is the high incidence of poaching by fishermen from the Dominican Republic (DR). During the

2000-2002, nine vessels and approximately forty dinghies with hooka compressors with a total of one hundred fishermen were apprehended (the captain and engineer from each vessel received custodial sentences with the remainder of the crew being repatriated). The DECR subsequently confiscated and either sold or sunk the vessels. The development of a policy under which each poacher vessel is sunk is desperately needed since many of these vessels sold to Belongers find their way back to the DR only to reappear within TCI waters poaching again. The Marine Branch of the RTCPF conduct joint operations with the DECR utilizing offshore capable patrol vessels. Location of poaching vessels is achieved using a Fisheries Officer as a spotter in the Police aeroplane that conducts regular patrols of the TCI economic exclusive zone. A further concern is that foreign fishermen employed legally to assist TCI fishermen gain a great deal of knowledge regarding the fishing grounds of the TCI and can pass on this information to the poachers. The Dominican poachers conduct their fishing activities using hooka and spear guns (both of which are illegal in the TCI). A major problem with illegal fishermen based both in/outside the TCI is that they plan only to be fishing in the TCI over a limited time frame (months or hours). Therefore they do not have a long-term interest in the health of the fishery, demonstrated by the fact that the majority of their catches consist of undersize, out of season, berried crawfish taken by illegal methods.

#### THE STATE OF THE FISHERY

The lobster fishery is exhibiting signs of overfishing, Clerveaux (2001c) demonstrated that the ratchet effect of increasing effort to maintain fishing yields is occurring with fishermen deploying faster larger vessels and travelling further afield to land comparable amounts of lobster. Bioeconomic analysis of the lobster fishery advocates a reduction in the number of fishing vessels gradually from 198 in 2002 to 73 by 2010 with no concomitant increase in vessel size or numbers of fishermen (Puga 2002). It is clear from mathematical modeling that the MSY for lobster in the TCI has been surpassed and that increased effort maintaining catches is actually masking a decline in the lobster stocks. It is therefore of grave concern that the lobster fishery will subsequently crash, placing additional pressures on the conch and scale-fish populations if fishing effort is not reduced. At present the conch stocks are healthy and well managed by a quota: determined by a recent nationwide visual census and mathematical modeling (Clerveaux 2001a, Clerveaux 2001b, Medley 1999, Ninnes 1994, Berg JR 1989). However, there is no room for increasing the quota, which both processing plant operators and the fishermen will advocate to maintain marine product landings and revenue. Furthermore, the high percentage of legal foreign fishermen and the trend for Belonger fishermen upon retiring applying for and obtaining permits for foreign fishermen to work for them is a worrying trend as fishing effort continues to increase (Table 4). Scale-fish populations are not fished commercially to any extent, offering an opportunity for fishermen to diversify into. Although for a scale-fish operation to be financially viable, a significant investment by fishermen in time and labor is required. There is currently little expertise in the



islands amongst the local population to operate a commercial scale-fish, fishing vessel. For a scale-fish fishing vessel to be economically viable, it must stay at sea fishing for several days. This is a big hindrance to the local fishing populace who are used to spending no more than eight hours at sea each day and have no desire to change this.

**Table 4.** Number and percentage of licensed commercial foreign fishermen exerting effort within the TCI fishery.

Year	Commercial fishermen	Foreign fishermen	Percentage of foreign fishermen
2001-2002	378	52	13
2000-2001	350	59	17

Source: Department of Environment and Coastal Resources license application forms.

#### APPROACH TAKEN TO MANAGE THE FISHERY

During 2001 a more rigorous approach to enforcement of fisheries legislation was taken. The decision to take a top down approach was taken as fishermen were blatantly flouting the fisheries legislation, especially with regard to the landing of undersize lobster (up to 70 % were undersize on the 1<sup>st</sup> of August 2001). A successful prosecution of a processing plant and a Belonger fisherman lead to a dramatic reduction in the undersize lobster being landed (Vaughan 2001 pers. obs.). Fisheries Officers are often constrained in their jobs by strong family and fishing ties inherent within the islands, indeed many of the Fisheries Officers are ex-commercial fishermen. Therefore, warnings are commonly given rather than legal action, acting as little future deterrent to the fisherman. By stressing that each Fisheries Officer has a duty to enforce the legislation, and establishing an environmental education program which started with the establishment of two Environment Officers, the DECR started to take a holistic approach to fisheries management in 2001. The Environment Officers were tasked with raising environmental awareness amongst the general public and running a turtle tagging/monitoring program. Awareness of the importance of leaving undersize lobsters was stressed by issuing each commercial fisherman with an information sheet and a plastic caliper to measure the lobsters carapace length.

To improve the effectiveness of the extensive MPA system throughout the country (established to protect lobster, scale-fish and conch stocks and to provide managers with a tool to regulate development), the MPA boundaries were depicted for the first time in 2003 on commercial readily available/affordable navigation charts. Substantial effort and expense has been channeled into demarcating the MPA boundaries - this process is ongoing. A review of the Fisheries Protection Ordinance was conducted in 2002. Alterations to tighten up the legislation are under consideration with the Attorney General. Once reviewed the changes will go to the FAC for discussion and for the members to gather comments from other stakeholders.

The DECR is fairly well funded and equipped compared with other Caribbean

nations (Gravestock 2002), nevertheless the extent and number of MPAs precludes thorough and effective management. Indeed, the very fact that so much of the territorial waters are protected causes a great deal of conflict between the DECR and fishermen.

Rapid development throughout the islands, and the governmental view that cruise ship tourism is the way for the islands to press ahead economically, will further stretch the resources of the DECR; this in turn compromises its' ability to secure the sustainable and wise use of the natural resources of the TCI for future generations unless the DECR is further strengthened with personnel, equipment and expertise.

### CONCLUSION

In order to maintain an economically and ecologically viable fishery, several steps need to be taken to reduce effort within the fishery and to ensure that the local people, who have a long-term stake in the environmental integrity of the fishery, are those that benefit directly from the fishery. Rapid development of the TCI, in conjunction with rapidly increasing fishing efficiency and effort through the use of foreign fishermen, larger vessels, larger engines etc. are the main threats to the marine resources of the islands.

In order to constrain fishing effort emphasis should be on:

- i) The implementation of a cap on the number of commercial foreign fishermen that are issued licenses - these fishermen should only be issued licenses in accordance with the existing legislation: i.e. they are to assist an elderly or infirm "Belonger" fisherman. The assistance should be limited to one commercial foreign fisherman to each such person and no foreign fisherman should be issued if the "Belonger" ceases to fish.
- ii) Removal of the power to issue foreign fishermen licenses from the Minister for Natural Resources. This capability should be transferred to the FAC to negate political pressure being exerted on the Minister each year by "Belongers" wanting foreign fishermen to work for them.
- iii) Banning hooking to catch lobster, implemented within a year following an extensive retraining program whereby the older fishermen (proficient in the use of the toss and the bully to catch lobster) are used to train fishermen that have no experience with this gear type.
- iv) Continue the process of demarcating the boundaries of the marine protected areas and follow through with the campaign to raise awareness of their use and purpose amongst marine resource users.
- v) Ban the sale of lobster at markets, restaurants, shops and hotels during the closed season, thereby reducing the incentive for fishermen to poach off season since the demand for this product is immediately removed.

Development is already eroding the integrity of the MPA system within the TCI; this is due to the fact that the islands have become very accessible due to the high number of scheduled flights from the USA and Europe. Tourism brings with it benefits for a country's economy, however a country must decide at what part of the

spectrum is it most suited for economically, environmentally and socially. With a country aiming for exclusive tourism, the economic benefits can be high and although the environmental resources per tourist are also high, the overall impact upon the environment is much less than in a situation where a country aims for mass marketing and medium/low end tourism, i.e. package holidays and cruise ship developments. With cruise ships now docking on a regular basis on Grand Turk, the pressure upon MPAs around Grand Turk is mounting. As tourism increases throughout the islands and economics favor the development of scale-fish resources, then this resource will come under pressure. Unfortunately this resource is likely to be exploited by a select few people utilizing foreign labor to catch the fish. This, in turn, allows the common marine resources of the islands to be eroded by those that have little or no long-term stake in the environmental integrity of the Turks and Caicos Islands.

It is the continued commitment and effort of those people in the TCI acting as the stewards of the marine resources that hold the key to the long-term protection and utilization of those resources for future generations. A holistic approach to management that encompasses the involvement of stakeholders through the utilization of an effective FAC and regular fishermen's meetings, and the continued active enforcement of fisheries/national parks legislation through a "top down" approach to management should be continued. This, in-conjunction with the environmental education and outreach approach "bottom up" offers the most hope for the sustainable and wise use of the marine resources of the TCI.

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